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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,894	01/31/2001	Junichi Akiyama	202594US2RD	1087
22850	7590	02/17/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			PSITOS, ARISTOTELIS M	
			ART UNIT	PAPER NUMBER
			2653	
DATE MAILED: 02/17/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/772,894	AKIYAMA ET AL.	
	Examiner	Art Unit	
	Aristotelis M Psitos	2653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-8 and 20-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-8 and 20-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/27/04 has been entered.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 2,7, 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Tanaka considered with JP 11-265520/Ito et al, and both further considered with He et al or as discussed below in paragraphs.

With respect to the independent claims 2 and 21, the following analysis is made.

Claim 2**Tanaka**

A thermally assisted magnetic recording head capable
of recording information magnetically on a recording
medium, comprising:

see abstract/title

a laser device configured to emit a light to heat
the recording medium to reduce a
magnetic coercive force thereof;

laser source102/col.9
lines 50 plus for instance

a light absorbing film provided between the

see col. 6, lines 30-41,

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laser device and the recording medium

element 32

the light absorbing film having an aperture
through which the light is applied to the recording
medium

see hole 33 in above noted
column & lines

a magnetic pole configured to record the information
magnetically on the recording medium by applying :
recording magnetic field to the recording medium having
the reduced coercive force;
and

mag. Pole/see 90/91
see col. 9, lines 6-20 for instance

an optical light collecting unit configured to converge the
light emitted from a light emitting face of the laser device
and to direct the converged light into the aperture,

see secondary reference
to He et al

the aperture being adapted so that a polarizing direction
of the light emitted from the laser device is approximately
perpendicular to a direction along a longitudinal extension of
recording tracks formed on the recording medium,

inherently present

a width W1 of the aperture taken along the polarizing direction
being smaller than a width W2 of the aperture taken approximately
perpendicular to the polarizing direction,
the width W1 being shorter than 1/2 of a wavelength at the
center of a spectrum of the light emitted from the laser device,
and

see JP document
and col. 6 lines 1-26 of
Tanaka

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the optical light collecting unit shifting a peak of a distribution of inherently follows from
a light intensity of the converged light to the magnetic pole. He et al.

In the above analysis, Tanaka discloses a near field thermally assisted magnetic recording system. Tanaka further discloses an aperture less than the wavelength of the laser beam - see either the abstract or col. 8, lines 3 through 10. See also the discussion at col. 6 lines 1-26, which give various wavelengths and spot diameters.

There is no particular orientation as recited by the claimed limitations.

The Japanese reference, alternatively the Ito document that is the U.S. equivalent thereof, as noted in column 6 with respect to figure 4b further teaches such in this environment.

It would have been obvious to modify the base system of Tanaka with the above teaching from the JP document for the reasons discussed therein and as indicated in the submitted OA from the JP office/part of the IDS submitted on 10/2/03 as stated therein with respect to paragraphs 24-26 and figure 4b in the JP document.

Ito et al teach in this environment the use of optical collecting elements for their inherent use of focusing light – see the discussion with respect to element 76 in figure 14a.

It would have been obvious to modify the base system of Tanaka with the above light-collecting element taught by the JP/Ito et al document, motivation is to permit proper focusing of the light spot upon the record medium.

There is no light converging element as now claimed and function thereof in the above documents.

He et al, discloses in this environment the ability of including a light converging element – note the diffraction pattern/grating established by such an element 130.

See the discussion in the abstract and at col. 2 lines 15-30.

It would have been obvious to modify the system of Tanaka-JP 11-265520/Ito et al with the above additional teaching from He et al, motivation is as discussed in He et al – col. 1 lines 23 plus.

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The limitations of claim 20, along with the actuating mechanism and the recording material limitations of claim 22 are met by Tanaka, see the discussing with the driving mechanism in the third aspect/embodiment at col. 3, lines 45-50.

With respect to claims 23 and 24, the film in Tanaka meets the newly presented claims.

Independent claim 21 follows the limitations of claim 2 and falls as analyzed above.

Response to Arguments

Applicant's arguments filed 12/27/04 and are moot in view of the new grounds of rejection.

2. Claims 3, 4 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claims 2, 7, 20-22 as stated in paragraph 1 above, and further in view of Kobayashi et al.

Kobayashi et al teaches the appropriate dielectric arrangement in his laser aperture system (element 6).

With respect to the range value of claim 4, such is met by the thickness of the insulating material (6) in the Kobayashi et al reference, i.e., 1600 angstroms is within the range specified.

It would have been obvious to modify the base system of the references relied upon above with the additional teaching from Kobayashi et al for the reasons noted in col. 2 lines 35-49.

3. Claims 5 & 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claims 2, 7, 20-22 as stated in paragraph 1 above, and further in view of the ISOM Technical digest article.

With respect to the limitations of claims 5 and 6 the examiner relies upon the discussion of the ISOM article with respect to the loss versus mode of operation – section 2 of the article as it applies to the width requirements of claim 5 and the mode of operation (TM) of claim 6.

It would have been obvious to modify the base system of Tanaka considered with JP 11-265520/Ito et al with the above teaching from the ISOM article, motivation is to provide for a better throughput of the optical power for narrow slits in this environment (high density recording) and insure proper signal recording.

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4. Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claims 2,7, 20-22 as stated in paragraph 1 above, and further in view of Mononobe ET al-WO98/10296. The examiner is providing a copy of US 6,236,783 as the English translation of the WO document, and no copy of the WO document to applicants.

Tanaka and JP 11-265520/Ito et al are relied upon as stated in paragraph 8 above with respect to the base claim 2.

With respect to the limitation of claim 6 (TM) mode of laser oscillation and the aperture of is filled with a dielectric material such is taught by the WO document – see col. 18, lines 10-16.

It would have been obvious to modify the base system of Tanaka, JP 11-265520/Ito et al with the above teaching of the Mononobe et al document, motivation is as discussed in Mononobe et al to reduce loss in the TM mode. The examiner concludes that the TM mode of operation of the oscillator is what the TM mode in this passage is referring.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable the art as applied to claims 2,7,20-24 as stated in paragraph 1 above further considered with the Kann et al article.

Claim 5 describes the absorption loss through the aperture. The examiner interprets this claim to mean that such a loss is peculiar to the type of operational mode, i.e., the TM mode as depicted in figures 8-12 of this application. If this is incorrect, then applicants' cooperation is respectfully requested in interpreting this claim.

The Kann et al article, note section 4 in particular, discusses the differences between absorption in the TE vs. the TM mode of operation in this environment. See also the discussion of figure 5. The examiner concludes that the differences between the modes of operation (as noted in figure 5) meet the claimed limitation of "10 times as much" absorption loss.

It would have been obvious to modify the base system of Tanaka considered with JP 11-265520/Ito et al with the above teaching from the Kann et al article, motivation is to use the difference is heat loss in the TM vs. TE mode of operation to increase the heating ability in the record medium in order

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to provide for proper near-field recording parameters – i.e., the use of heat/thermal in the near-field heat assisted magnetic recording.

6. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the art as applied to claims 2 and 21 above, and further in view of Ohuchida.

Ohuchida discusses the use/ability of diffraction grating lens with appropriate variations in the pitches so as to establish/yield an asymmetrical distribution of the light, see the discussion with respect to the sixth structure.

It would have been obvious to modify the base system as discussed above in paragraph 1, with the additional teaching from Ohuchida, motivation is as discussed with respect to the sixth structure so as to permit better efficiency of the light in the overall system operations especially for servo controls.

Conclusion

The Iwano et al reference is cited as illustrative of another asymmetric lens – see fig. 19b.

The examiner has reviewed the disclosure, and strongly urges applicants' to include the terminology with respect to the description of figure 28B, page 42, lines 6-9, i.e., the claim now broadly recites shifting of the peak amplitude to the magnetic pole, and such is considered inherently present. What is not is the ability of shifting such "closer to" in order to improve the efficiency of the light interactions with the magnetic poles for writing. The examiner cannot read limitations from the disclosure into the claims to avoid the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aristotelis M Psitos whose telephone number is (703) 308-1598. The examiner can normally be reached on M-Thursday 8 - 4.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William R. Korzuch can be reached on (703) 305-6137. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aristotelis M Psitos
Primary Examiner
Art Unit 2653

A handwritten signature in black ink, appearing to be 'AP', written over a circular stamp.

AMP

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